

WE CLAIM:

WHAT WE CLAIM IS:

Claim 1. An espresso making apparatus comprising a supply of pressurized hot water, a pressure chamber adapted to receive a predetermined amount of ground coffee therein, a piston movable within said pressure chamber to compress ground coffee located within said pressure chamber, a cam, a motor for rotating said cam, a cam follower engageable with said cam and being operatively connected to said piston for moving said piston to compress ground coffee located within said pressure chamber in response to rotation of said cam, a sensor for sensing a parameter of said motor when said motor rotates said cam to compress ground coffee located within said pressure chamber, a control for deenergizing said motor to stop movement of said cam when the ground coffee in said pressure chamber is compressed a predetermined amount and the sensed motor parameter is equal to a predetermined value, a fluid passageway for directing said supply of pressurized hot water through the compressed ground coffee in said pressure chamber to brew espresso coffee, and an outlet from said pressure chamber for directing the brewed espresso coffee to a use location.

Claim 2. An espresso making apparatus as defined in claim 1, wherein said sensor is a current sensor and the sensed motor parameter is motor current.

Claim 3. An espresso making apparatus as defined in claim 1, wherein said sensor is a voltage sensor and the sensed motor parameter is motor voltage.

Claim 4. An espresso making apparatus as defined in claim 1, wherein said sensed motor parameter is motor torque.

Claim 5. An espresso making apparatus as defined in claim 1, wherein said fluid passageway for directing said supply of pressurized hot water through the compressed ground coffee in said pressure chamber is at least in part located in said piston.

Claim 6. An espresso making apparatus as defined in claim 1, wherein said pressure chamber includes a first opening for receiving said piston, and a second opening for discharging compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee.

Claim 7. An espresso making apparatus as defined in claim 6, further including a second piston having a first closed position for sealing said second opening, said second piston being movable to a second open position to discharge compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee and a latch member for latching said second piston in said first closed position.

Claim 8. An espresso making apparatus as defined in claim 7, wherein said latch member has an unlatched position in which said second piston is unlatched to enable said second piston to move to said second open position to provide for the discharge of the compressed ground coffee from said second opening in said pressure chamber after espresso has been brewed from said compressed ground coffee.

Claim 9. An espresso making apparatus as defined in claim 8, wherein said motor is energizable to rotate said cam to move said piston toward said second opening to enable said piston to push said compressed ground coffee from said pressure chamber through said second opening after espresso has been brewed from said compressed ground coffee.

Claim 10. An espresso making apparatus as defined in claim 1, wherein said pressure chamber is adapted to receive different predetermined amounts of ground coffee therein for brewing different espresso drinks each of which may require a different predetermined amount of ground coffee and said control for deenergizing said motor deenergizes said motor and stops movement of said cam when said ground coffee in said pressure chamber is compressed a predetermined amount irrespective of the amount of ground coffee in said pressure chamber.

Claim 11. An espresso making apparatus as defined in Claim 10, wherein said pressure chamber includes a first opening for receiving said piston, and a second opening for discharging compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee.

Claim 12. An espresso making apparatus as defined in Claim 11, further including a second piston having a first closed position for sealing said second opening, said second piston being movable to a second open position to discharge compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee and a latch member for latching said second piston in said first closed position in which said second piston seals said second opening.

Claim 13. An espresso making apparatus as defined in Claim 12, wherein said fluid passageway for directing said supply of pressurized hot water through the compressed ground coffee in said pressure chamber is at least in part located in said piston.

Claim 14. An espresso making apparatus as defined in Claim 13, wherein pressurized hot water is directed through said fluid passageway in said piston when said piston pushes said compressed ground coffee from said pressure chamber through said second opening to ensure that the compressed ground coffee does not stick to said piston.

Claim 15. An espresso making apparatus comprising a supply of pressurized hot water, a pressure chamber adapted to receive ground coffee therein, a piston movable within said pressure chamber to compress the ground coffee located within said pressure chamber, a motor for moving said piston to compress the ground coffee located within said pressure chamber, a sensor for sensing a parameter of said motor when said motor moves said piston to compress the ground coffee within said pressure chamber, a control responsive to said sensor for deenergizing said motor to stop movement of said piston when the ground coffee in said pressure chamber is compressed a predetermined amount and said sensor indicates the sensed motor parameter is equal to a predetermined value, a fluid passageway for directing said supply of pressurized hot water through the compressed ground coffee in said pressure chamber to brew espresso and an outlet from said pressure chamber for directing the brewed espresso to a use location.

Claim 16. An espresso making apparatus as defined in claim 15, wherein sensor is a current sensor and said sensed motor parameter is motor current.

Claim 17. An espresso making apparatus as defined in claim 15, wherein sensor is a voltage sensor and said sensed motor parameter is motor voltage.

Claim 18. An espresso making apparatus as defined in claim 15, wherein sensor is a torque sensor and said sensed motor parameter is motor torque.

Claim 19. An espresso making apparatus as defined in claim 15, wherein said fluid passageway for directing said supply of pressurized hot water through the compressed ground coffee in said pressure chamber is at least in part located in said piston.

Claim 20. An espresso making apparatus as defined in claim 15, wherein said pressure chamber includes a first opening for receiving said piston and a second opening for discharging compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee.

Claim 21. An espresso making apparatus as defined in claim 20, further including a second piston having a first closed position for sealing said second opening, said second piston being movable to a second open position to provide for the discharge of compressed ground coffee from said pressure chamber after espresso has been brewed from said compressed ground coffee and a latch member for latching said second piston in said first closed position in which said second piston seals said second opening.

Claim 22. An espresso making apparatus as defined in claim 21, wherein said latch member has an unlatched position which unlatches said second piston to enable said second piston to move to said second open position to provide for the discharge of the compressed ground coffee from said second opening in said pressure chamber after espresso has been brewed from said compressed ground coffee.

Claim 23. An espresso making apparatus as defined in claim 15, wherein said motor is energizable to move said piston toward said second opening to enable said piston to push said compressed ground coffee from said pressure chamber through said second opening when said latch member is in said unlatched position after espresso has been brewed from said compressed ground coffee.

Claim 24. An espresso making apparatus as defined in claim 15, further including a cam member connected to said motor and rotatable in response to energization of said motor, said cam member being operatively associated with said piston for moving said piston in response to rotation of said cam member.

Claim 25. A method of brewing espresso from a supply of pressurized hot water and ground coffee which has been compacted a predetermined amount in a pressure chamber by a piston which is moved by a motor to compact the ground coffee in the pressure chamber including the steps of:

providing ground coffee in said pressure chamber;

energizing the motor;

moving the piston within said pressure chamber to compact the ground coffee in response to energization of the motor;

sensing a motor parameter of said motor while said motor moves said piston and compacts the ground coffee in said pressure chamber; and

deenergizing the motor to stop movement of said piston when the sensed motor parameter is equal to a predetermined value and said ground coffee is compacted a predetermined amount in said pressure chamber.

Claim 26. A method of brewing espresso as defined in claim 25, further including the steps of:

directing a predetermined amount of pressurized hot water through the compacted ground coffee in said pressure chamber to brew espresso; and

energizing the motor to further move the piston within said pressure chamber to expel the compacted ground coffee from which espresso has been brewed from the pressure chamber.

Claim 27. A method of brewing espresso as defined in claim 26, further including the step of directing pressurized hot water to the pressure chamber to assist in expelling the compacted ground coffee from which espresso has been brewed from the pressure chamber.

Claim 28. A method of brewing espresso as defined in claim 25, wherein said step of sensing a motor parameter includes the step of sensing motor current and said step of deenergizing the motor to stop rotation of the cam and movement of the piston is performed when the motor current is equal to a preselected motor current.

Claim 29. A method of brewing espresso as defined in claim 25, wherein said step of sensing a motor parameter includes the step of sensing motor voltage and said step of deenergizing the motor to stop rotation of the cam and movement of the piston is performed when the motor voltage is equal to a preselected motor voltage.

Claim 30. A method of brewing espresso as defined in claim 25, wherein said step of sensing a motor parameter includes the step of sensing motor torque and said step of deenergizing the motor to stop rotation of the cam and movement of the piston is performed when the motor torque is equal to a preselected motor torque.